How Does Complexity Affect the Relationship Between Supply Chain Integration and Firm Performance? A Conceptual Framework

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ABSTRACT
Supply chain integration has become a major challenge for companies in the current context. Information sharing, and collaboration improve supply chain flexibility, tractability, and efficiency. Several studies have demonstrated, the positive and the significant relationship between supply chain integration and firm performance. Other studies have focused on the factors that affect this relationship. Supply chain complexity is a contingency factor that affects this relationship. Based on the literature review and through a confrontational approach, the authors propose a conceptual model to show how the complexity of supply chain affects the benefit of integration. Propositions are posited with suggestions for further research. Authors suggest that there are three dimensions of supply chain complexity which moderate the effect of supply chain integration on the firm performance: upstream, internal and downstream complexity; that there is a taxonomy of firm’s group based on their level of each dimension of complexity and the effect of integration differs from one group to another.

KEYWORDS
Contingency and Configurational Approach, Firm Performance, Integration, Supply Chain Complexity

1. INTRODUCTION
It is widely acknowledged in the literature that firms do not develop their competitiveness as a single entity but do so within a chain by developing business relationships with their customers and suppliers (Min et al., 2005; Wang and Chan, 2009). Competition will not be between companies but rather between supply chains (Lambert and Cooper, 2000).

This shows the interest that the literature has given these recent years to the study of inter-organizational relations between firms (Cousins, 2005; Flynn et al., 2010; Zhao et al., 2011; Barratt and Barratt, 2012; Liu, 2009; Williams et al., 2013; Le Dinh and Thi, 2012; Ryan et al., 2014)). In addition, inter-organizational relationships include different levels of interaction between firms within the same supply chain. As part of this relationship, firms exchange and share information upstream and downstream of the chain in order to be more performants (Towers and Burnes, 2008). The
logistic integration is also a key success factor of some specific business relationship like franchising (Thierry et al., 2018).

The integration of the supply chain leads to a synchronization of the flows as well as information sharing and collaboration between the company and its partners in the decision-making process. Consequently, logistics costs decrease, the products’ quality increases and the delivery time shortens, leading, thus, to an improvement of the operational and financial performance of the company.

Furthermore, to be more competitive, the supply chains must be more integrated. Through a dyadic perspective (Mentzer, 2001), the supply chain of the focal firm must be more integrated both internally and externally (with their suppliers and customers). This needs more integration of information system, more collaboration and more information sharing.

Several empirical researches had shown that there is a significant and positive relationship between the level of integration of the supply chain and the firm performance (Rosenzweig and al., 2003; Menzer, 2004; Gimenez and Ventura, 2005; Sahin and Robinson. 2005; Fabbe-Costes et al., 2008; Huo et al., 2012; Alfalla-Luquea et al., 2013; Yu et al. 2013; Irani et al., 2014; Veera et al., 2014; Huo et al., 2015; Zhao et al., 2015).

However, several factors affect this relationship. Through a contingency approach, the impact of supply chain integration on firm performance is moderated by factors such as demand and technology (Vaart et al., 2007; Boonitt et al., 2011), environmental uncertainty (Wong et al., 2011), supply chain complexity (Gimenez et al., 2012), competitive strategies (Huo et al., 2014), long term relationship (Prajogo et al., 2014) and trust (Capaldo and Giannoccaro 2015).

Other authors had analyzed this contingency factor under a configurational perspective (Flynn et al., 2009; Huo et al., 2015; Cao et al., 2015; Liua et al., 2016). Indeed, this latter perspective offers a multidimensional analysis, the aim is to establish some configurations which will enable to analyse the benefit of supply chain integration under many contingency moderating variables in the same time.

Supply chain complexity involves more uncertainty and disruptions for the focal firm (Bodea and Wagner, 2015). As a contingency factor, it affects the relationship between supply chain integration of the focal firm and its operational performance. The more complex the supply chain is, the higher the effect of the integration is, while the effect of integration is less significant when the complexity is lower (Gimenez et al., 2012). Complexity was used in this research as a single variable. However, many dimensions of the supply chain complexity exist: Internal/external and structural/dynamic (Serdarasan, 2013), so future researches might include all of them as a holistic perspective.

The benefit of supply chain integration depends on the level and dimension of its complexity.

So, the relationship between supply chain integration and firm performance may be affected, as much by the complexity of its internal supply chain as by the complexity of its business relationship and decision making with its consumers and suppliers.

This article aims to establish, a conceptual framework, based on literature review, in order to explain how complexity, as apprehended above, moderates the relationship between supply chain integration and firm performance. On This framework, based on the literature review, the authors have drawn up a proposal configuration of different level of supply chain complexity in order to explain the moderating effect on each of them.

The paper is structured as follows: The next section will present the supply chain integration as a multidimensional concept; the authors will explain how the focal firm can make its supply chain more integrated. In the third section the authors will show how the complexity of the supply chain can be apprehended and measured under a systemic approach. Finally, the authors suggest sum supply chain complexity configurations to analyse the moderate effect of this complexity on the benefit of the integration.
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